REMARKS

Claims 1-62 are pending. Reconsideration of the present application is respectfully requested.

Grounds of Rejection to be Reviewed

A Claims 1-23 and 60-62 stand rejected under 35 U.S.C. § 101 as allegedly claiming an invention that is not one of the statutory categories of patentable subject matter.

B Claims 1-62 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Zhang et al. (U.S. 2002/0010938) in view of Lennon et al. (U.S. 2002/0152267).

Argument

A Claims 1-23 and 60-62 claim statutory subject matter

Claims 1-23 and 60-62 stand rejected under 35 U.S.C. § 101 as allegedly claiming an invention that is not one of the statutory categories of patentable subject matter. This rejection is respectfully traversed.

With respect to claims 1-23, the Office suggests that these claims are directed to non-statutory subject matter insofar as it claims a multimedia streaming server and a multimedia streaming client which the Office alleges are "computer programs (software per se) performing various functionalities. These functionalities do not manipulate any hardware or tangible entity. Therefore, the software constructs are non-statutory entities as detailed in MPEP 2106." Applicants respectfully disagree.

First, the Federal Circuit recently issued In re Bilski, 88 USPQ2d 1385, __ Fed.3d __ (Fed. Cir. 1030.08 En banc), which deals with patentable eligible

subject matter under §101. Under *Bilski*, "[a] claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing." To avoid preemption the Federal Circuit emphasized that "the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility;" that "the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity;" and that the transformation "must be central to the purpose of the claimed process."

In this instance, claims 1-23 are tied to a particular machine, in this case an multimedia streaming apparatus that includes two devices. The first device is a multimedia streaming server. The server is a physical device that has a program loaded into it. While "server" can mean either the computer program or a computer, in this instance, because the claim states are reciting a multimedia streaming apparatus, it is clear that this server is not just software. It is in fact the computer that runs a computer program and therefore is a physical object. Hence, there is not possibility of pre-emption and in fact these claims are clearly tied to statutory category, i.e., a machine in that it is a multimedia streaming apparatus. Dependent claims 2-4 and 20-23, for instance, make this point even more clear in that the claims detail the physical structure of the multimedia streaming server in identifying various units and buffers in detail.

In light of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-23 under 35 U.S.C. §101.

With respect to claims 60-62, the Office's view on how to word computer readable media claims changes from time to time and Applicants have no trouble

adopting the most recent iteration of what the Office would prefer, i.e., the claims are now recited, as suggested by the Examiner, by replacing the word "medium" with "storage media", and leaving the term "tangible" in. It should be noted that the undersigned believes that it is more appropriate to leave the phrase "computer readable" in the claims and notes that, in reviewing page 21, lines 16-21, of the amended Specification, reference to the storage media should be sufficient to exclude carrier waves from the scope of claims 60-62. In light of this change, withdrawal of this rejection is respectfully requested.

B. Claims 1-62 are patentable over the applied art

Claims 1-62 stand rejected in the Office Action under 35 U.S.C. §103(a) as allegedly being obvious over Zhang et al. (hereinafter "*Zhang*") in view of Lennon et al (hereinafter "*Lennon*"). This rejection is respectfully traversed.

1. Overview of Arguments

There is a basic, high level distinction between the present invention and the applied art, even when the applied art is viewed in combination. Though oversimplified and explained in more detail below, as disclosed in the present application, the present application selects from, e.g., one of three different multimedia streams on a frame-by-frame basis according to network bandwidth information. This means that if the network is congested, a lower quality of service level frame can be sent, but if the bandwidth increases, a higher quality of service level can be sent for the next frame. This is reflected in the claims with respect to the language regarding the metadata corresponding to the multimedia data intended

to be provided for service and the network bandwidth information which is input from the client and taken in the context of the claims.

The applied art, and in particular Zhang, controls the *speed of transmission, and does not select one multimedia stream over another,* by a reallocation of network architecture. It does not use metadata corresponding to multimedia data intended to be provided for service that is parsed to control the streaming of multimedia data corresponding to a predetermined quality of service level. This fundamental distinction is found in the claims and is apparent from a review of the prior art in the present application. In greater detail, Applicants explain this position, below.

2. *Zhang*

Zhang discloses a resource allocation mechanism in a multi-stream IP network. It includes three basic and common components. A server 210, the Internet 220 and a client 230. According to paragraph [0024], *Zhang* appears to be directed to provide a multi-media streaming TCP-friendly transport protocol that can adaptively estimate the network bandwidth and smooth *the sending rate.*

Accordingly to paragraph [0025], this is done through a resource allocation architecture that allocates resources among multiple media streams over a network. In paragraph [0026], the available bandwidth is said to be estimated at a sender based upon the transmission characteristics of the connection monitored at the receiver side. A global buffer is allocated for the mixed media data stream to be transmitted from the sender to the receiver as a function of the estimated available bandwidth at the sender. However, a portion of each video object plane (VOP) in the

global buffer is pre-encoded with respect to a quantization parameter (QP) of the VOP. *The VOP in the global buffer is then encoded based on the QP sent with the VOP.* This is distinct from the presently claimed invention, particularly in that it does not involve metadata corresponding to multimedia data intended to be provided for service that is parsed to control the streaming of multimedia data corresponding to a predetermined quality of service level, as explained below.

Further, the sender transmits the encoded VOP in the movable buffer at a regulated sender transmission rate from the sender as a function of the estimated available bandwidth of the sender.

As articulated in *Zhang's* paragraph [0028], the TCP-friendly protocol is said to be used to obtain network characteristics included in the packet-loss rate, delay and jitter. Network characteristics are used to estimate the available network bandwidth and to make adjustments *in the sending rate*. As identified in paragraph [0043] of *Zhang*, the multimedia streaming TCP-friendly transport protocol (MSFTP) is said to be a rate-based TCP-friendly protocol that continuously monitors a connection between the sender and the receiver, which are then used to regulate the bit transmission rate of the server 210.

The bolded and underlined quote of paragraph 0044 of *Zhang* at paragraph 7 of the Office Action is noted with appreciation, but the passage supports, rather than detracts from Applicant's basis point. The sentence "Combining this information with the media characteristics of media streams Video.sub.m, Video.sub.n, and Audio.sub.k, module 214adjusts the quality of the total transmitted streams by resource re-allocation in a Global Buffer Control module 216 at Server 210", taken in context, involves physical transmission adjustments, and not does not involve

metadata corresponding to multimedia data intended to be provided for service that is parsed to control the streaming of multimedia data corresponding to a predetermined quality of service level.

It also appears that the Office is relying upon the second implementation (as illustrated in Figure 9) showing a network adaptive sending rate control scheme. However, perhaps of greater relevance, is paragraph [0049] of Zhang (with respect to the first implementation) discloses the header of the sender-side packet includes the packet sequence number, a time stamp indicating the time when the packet was sent (ST1) and the size of the sending packet. The receiver is said to feed back to the sender such information the rate at which the data is received. Based on the receiver's feedback, the sender uses the TCP model *to adjust the sending rate* in a "TCP-friendly" manner.

However, with respect to the embodiment relied upon in the Office Action, the MSFTP includes a calculation of the available bandwidth that is said to be dynamic. It includes five stages (*i.e.,* MSFTP ABW estimation 910, pre-encoding 930, encoding 940, post-encoding 952 (update rate model 954), and frame-skipping control 960), as articulated in paragraphs [0106] - [0126]. An examination of this portion of the *Zhang* disclosure, and in particular a review of the equations used in these paragraphs, illustrates that the present invention is not disclosed therein. The explanation as to why *Zhang* does not anticipate the claims will be provided with respect to the rejected independent claims, as identified below.

3. Independent Claim 1

Claim 1 recites *inter alia* a multimedia streaming server which streams multimedia *corresponding to a predetermined quality of service (QoS) level in response to a parsing result of a metadata correspondence to the multimedia data intended to be provided for the service wherein the metadata has multimedia data and streaming-related Information.* This is described at various points in the present application, particularly at paragraph [0038] and with particular reference to Figure 10 starting at paragraph [0073] - [0076].[1] For instance, the number of the quality of service levels is determined when the metadata defined and the target bit rate of each level is determined based on the average bit rate of the multimedia data this can be done on a frame-by-frame basis. That is, the video stream might have three different levels and, as the network bandwidth changes dynamically, frames in sequence can be chosen from each of the levels in accordance with a particular bandwidth at that time. See paragraph [0072] as well as the description of Figure 11 starting at paragraph [0076].

As articulated in claim 1, the streamed multimedia data is dependent upon both the quality of service identified in the metadata corresponding to the multimedia data intended to be provided for service, as well as the network bandwidth information which is input from a client.

As further articulated in claim 1, the multimedia streaming client measures the bandwidth of the network to which the server is connected by using a time interval when the multimedia data is received and the information on the size of the multimedia data, and then transmits the measured bandwidth information to the

[1] The published version of the present application (U.S. 2005/0076136) will be used for ease of consideration.

server. This is explained, for instance, in paragraphs [0017], [0059] and [0060]. By this mechanism, only the metadata need be specified from multimedia data, and the apparatus and method of the disclosed exemplary embodiments can be applied regardless of the format of contents to be delivered without serious burden on the server, as identified in paragraph [0091] of the present application.

Not only is this far simpler, it is far different than the network adaptive sending rate control scheme articulated in *Zhang* which is dependent on a number of factors and has five stages to it.

For instance, *Zhang* does not include a multimedia streaming server which streams multimedia data corresponding to a predetermined quality of service level in response to a parsing request of metadata corresponding to the multimedia data intended to be provided for service and network bandwidth information which is input from a client, particularly where the multimedia streaming client measures the bandwidth of the network to which the server is connected by using a time interval when the multimedia data is received and information on the size of the multimedia data, and transmits a measured bandwidth information to the server.

As such, *Zhang* does not meet the recitation of claim 1 such as:

> 1. A multimedia streaming apparatus comprising:
> a multimedia streaming server which streams multimedia data corresponding to a predetermined quality of service (QoS) level in response to a parsing result of metadata corresponding to multimedia data intended to be provided for service and network bandwidth information which is input form the outside; and
> a multimedia streaming client which measures the bandwidth of a network to which the server is connected, by using a time when multimedia data is received and information on the size of the multimedia data, and transmits the measured bandwidth information to the server,
> wherein the metadata has multimedia data and streaming-related Information (Emphasis added).

It is noted that the Office applies Lennon for allegedly teaching metadata that has multimedia data and streaming-related data. It is respectfully submitted that this information would not be required by the *Zhang* system, and hence there is no reason, and the Office has not articulated any reason for the combination, as is required by relevant case law. The Office has the initial burden of establishing a **factual basis** to support the legal conclusion of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). For rejections under 35 U.S.C. § 103(a) based upon a combination of prior art elements, in KSR Int'l v. Teleflex Inc., 127 S.Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007), the Supreme Court stated that "a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some **articulated reasoning with some rational underpinning** to support the legal conclusion of obviousness." In re Kahn, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (emphasis added).

4. Claims dependent from claim 1

The Office asserts dependent claims 2-6, 19-23 are all met by *Zhang*. Applicants respectfully disagree. Building upon the explanation given above with respect to claim 1, it is noted that the fourth recitation of claim 2 does not seem to be present in any form in *Zhang*. Claim 2 recites *inter alia* that the quality of service processing units selects a quality of service available for service in response to the descriptor information and network band information and extracts multimedia data corresponding to a selected quality of service level from the data storage unit. As mentioned above, this can be done on a frame-by-frame basis. The undersigned could not identify corresponding structure in the network adapter rate control scheme of *Zhang*. See paragraph [0044] of *Zhang*, where such a feature would have logically been mentioned, if it existed in *Zhang*. Instead, the QoS Adaption and Global Resource Allocation Control Module 214 periodically estimates the available bandwidth from the MSTFP protocol, combines this information with "media characteristics" and reallocates resources, but nothing akin to the two steps (selecting QoS based on descriptor information and network band information and extracting multimedia data based on the selected QoS, from a data storage unit of claim 2.

This is particularly apparent with reference to claim 3 which actually identifies a frame selection unit which extracts frames corresponding to the quality of service level from the multimedia data stored in the data storage unit and stores the extracted frames in the buffer. *Zhang* mentions a "frame skipping module", but this is different than a frame selection unit which extracts frames corresponding to a quality of service level. The specific recitations regarding how the bandwidth

measuring unit operates and the structure in claims 20, 21 and 22 in particular are not met by *Zhang.*

While other distinctions undoubtedly exist in the dependent claims, Applicants will not belabor the point for sake of brevity. It is respectfully submitted, however, that independent claim 1 and the claims dependent therefrom are patentable for a variety of reasons, some of which have been identified above.

5. Independent claim 42

Claim 42 recites a multimedia streaming client which includes a bandwidth measuring unit which measures a network bandwidth by using the time interval when the multimedia data is received in the packet receiving unit and the size information of the data. Further, a message transmission unit transmits the measured network bandwidth to the server so that the transmission rate of the multimedia data transmitted from the server is adjusted to the network bandwidth. This can be done, on the fly, as explained above with reference to the frame-by-frame selection or extraction process and using the equation identified in claim 44, for instance, as the mechanism for determining network bandwidth. Hence, as identified in claim 45, the transmission unit can identify changes in the network bandwidth whenever the network bandwidth varies. It is respectfully submitted that, as with the explanation as to why claim 1 and its dependent claims are patentable, claim 42, as well as dependent claims 43-45, are also patentable. Specifically, at least the emphasized recitations of claim 42, reproduced below, are not met by *Zhang*:

> 42. A multimedia streaming client comprising:
> a packet receiving unit which receives the multimedia data from a server connected to a network;
> a buffer which stores the received multimedia data;
> a multimedia decoder which reproduces the data stored in the buffer;
> a bandwidth measuring unit which measures a network bandwidth by using the time when the multimedia data is received in the packet receiving unit **and** the size information of the data; and
> a message transmission unit which transmits the measured network bandwidth to the server **so that the transmission rate** of the multimedia data transmitted from the server is adjusted to the network bandwidth (Emphasis added).

The Office acknowledges that these features are not present in *Zhang* but suggests at page 8 of the Office Action that *Lennon* discloses these features. First, as explained above, there is no reason to combine *Zhang* with *Lennon,* but more fundamentally, the undersigned could not locate the alleged teaching of a "modification bandwidth #0239" in *Lennon.* The Office is respectfully requested to identify the portion of *Lennon* being relied upon with more specificity, if the rejection is continued.

6. Independent Claim 59

Independent Claim 59 is directed to a network bandwidth measuring method of a client which receives multimedia data from a server through a network. It includes the specific steps of setting the size value of an accumulated packet to zero, starting to receive a packet from a server, setting the time when the first packet is received as TS1, and, after the first packet is input until the last packet is input, whenever a packet is input, accumulating the size value of the packet to the size of the accumulated packet. When the last packet is input, the time is set to be TS2.

The network bandwidth is then measured by calculating the equation identified in claim 59 and feeding the measured network bandwidth information back to the server.

This very specific mechanism for network bandwidth measuring methods could not be found in *Zhang*. The Office identifies Figure 9, pages 7-9, regarding the Network Adaptive Control, particularly paragraph [0128], but none of these paragraphs discloses "accumulated packets" T1, T2 or the equation of claim 59. If the undersigned has overlooked some disclosure in this regard, the Examiner is invited to specifically point out any such disclosure but at least the following emphasized features could not be found:

> 59. A network bandwidth measuring method of a client which receives multimedia data from a server through a network, the method comprising:
> (a) setting the size value of an accumulated packet to 0;
> (b) starting to receive a packet from the server;
> (c) setting the time when a first packet is received as T1;
> (d) after the first packet is input till a last packet is input, whenever a packet is input, accumulating the size value of the packet to the size of the accumulated packet;
> (e) if the last packet is input, setting the time when the last packet is input as T2;
> **(f) measuring the network bandwidth by calculating** $\frac{Accumulated\ \ packet\ size \times 1000 \times 8}{TS2 - TS1}$ **; and**
> (g) feeding the measured network bandwidth information back to the server (Emphasis added).

7. Claim 7

The Office acknowledges that *Zhang* fails to disclose, among other features, a metadata parsing unit which parses the metadata and outputs the parsing result in the form of a descriptor. For this, the Office suggests that *Lennon* discloses such a

metadata parsing unit. Applicants respectfully submit that metadata parsing units *per se* are not novel and are not claimed to be novel by the Applicants. It is the use of the metadata parsing unit in the context of the claimed subject matter that makes this feature a patentable distinction. Whether *Lennon* discloses a metadata parsing unit or not, there is no reason one skilled in the art would adopt one in *Zhang,* which operates on a fundamentally different principle as articulated above and, in particular, does not appear to require nor would it benefit from the use of a metadata parsing unit.

Also, while in theory, *Zhang* might be updated or adapted to use XML, that change alone has not been established to lead to adoption of changes that would meet the present claim recitations. Specifically, neither *Zhang* nor *Lennon*, alone or in combination, teach, suggest or provide reasons to combine the features of claim in combination with claims 1 and 2 from which claim 7 depends.

The Office suggests that the use of a metadata parsing unit and XML would be obvious to one skilled in the art at the time of the invention because they would promote "efficiently using bandwidth". Applicants respectfully submit that this extremely broad and general desire to efficiently use bandwidth would not begin to teach or suggest the specific changes necessary to motivate or provide reasons such specific modifications to meet the present claims, or that such a modification would in fact promote efficient use of bandwidth. It is respectfully submitted that for a motivation to be valid reason for a hypothetical combination, the alleged motivation must have some nexus to the modification being suggested. It is respectfully submitted that such is not the case in the present circumstances.

8. Dependent Claims 9, 10, 11 and 31-38

Additionally, it is noted that claims such as claims 9, 10 , 11, and 31-38 which deal with very specific nodes and their identify and function are not disclosed in or hinted at by either of the references. Again, it is not apparent that there would be any benefit in attempting to combine *Lennon* with *Zhang,* but more importantly there is no suggestion for these very specific recitations. Appellants will not dwell on the specifics of these claims because they are so far off from the Examiner's proposed hypothetical combination. There seems little to say beyond, "not present in the applied art".

9. Independent Claim 24 and Claims Dependent Therefrom

Whether *Zhang* is viewed alone or in combination with *Lennon*, it is respectfully submitted that the applied prior art does not meet the recitations of claim 24. Specifically, claim 24 recites *inter alia* a quality of service processing which selects the QoS level available for service in response to a descriptor information, as derived from a metadata parsing unit which parses the metadata and outputs the parsing result in the form of a descriptor, and the network bandwidth information provided by a message receiving unit which receives network bandwidth information from a client connected to the network, and extracts the multimedia data corresponding to the selected QoS level wherein the metadata has multimedia data and streaming-related Information. This is particularly apparent when viewed in combination with the buffer that stores the extracted data since neither reference appears to disclose anything akin to an extraction process particularly one based on these two types of information. The global buffer control 216 of Zhang uses QoS

adaption and global resource allocation control. As explained above, desampler information and network bandwidth information is not used select QoS level.

As before, the dependent claims add the recitations which further remove the present invention from the applied art, as explained above. The arguments surrounding these additional claim features will not be repeated for sake of brevity.

10. Independent Claim 53 and Claims Dependent Therefrom

Claim 53 recites a streaming method of a server which is connected to a client through a network which includes receiving an estimated bandwidth of the network from the client and based on the descriptor obtained as a result of parsing metadata corresponding to the multimedia data desired to be provided for service, as selecting a current time segment, comparing the target bit rate defined in the descriptor for the selected segment with the network bandwidth and selecting the quality of service available for the service. This is the type of dynamic extraction of frames corresponding to the selected QoS level transmission to the client that were discussed above, i.e., each frame in the video, for instance, can be selected depending on its QoS level and the network bandwidth at the time it is to be transmitted in the sequence of video. Nothing in Zhang approximates or suggests this, but instead only disclosed a "frame skipping module", which does not have anything akin to these features, Lennon does not supply these teachings, and is not purported to by the Examiner.

Dependent Claims 54-58 again add features which further remove the present invention from the applied art that will not be separately discussed for sake of brevity.

Conclusion

Should any residual issues exist or arise, or should the Examiner wish to allow the application, he is respectfully requested to contact the undersigned at the number listed below.

Respectfully submitted,

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